

**USDA Federal-State Marketing Improvement Program (FSMIP)**

**Expanding the Michigan Asparagus Industry  
Through New Product Development  
And Enhanced Processing Technologies**

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**Regarding: 791N3000794 (MDA) and FSMIP Agreement No. 12-25-G-0366 (USDA)  
August 2004 Final Report to Michigan Dept. of Agriculture and U.S. Dept. of  
Agriculture**

## **Expanding the Michigan Asparagus Industry Through New Product Development And Enhanced Processing Technologies**

### **Statement of Issue or Problem**

The states of California, Washington, and Michigan represent over 95% of the asparagus production in the United States. Michigan produces approximately 15% of the total U.S. asparagus crop but nearly 50% of the country's processed pack. Oceana County produces 65% of the state's crop with significant production also coming from the counties of Mason, Berrien and Van Buren. Most of the asparagus produced in Michigan is processed (85%) with historically 2/3rds canned and 1/3rd frozen.

Imports of asparagus have grown substantially with most of the supply and growth coming from Peru and Mexico. Under NAFTA, Mexico receives preferential tariff treatment in the U.S. market, while Peru receives duty free access in the U.S. market as a benefit of the Andean Trade Preference Act of 1991.

Asparagus imports threaten the viability of the Michigan asparagus industry, which has a farm gate value of \$17 million with an estimated impact of \$65 million to the local economy. The Michigan asparagus industry traditionally processes 20 to 26 million lbs of asparagus annually or roughly 85 % of its total production. Imports of processed and fresh asparagus products into the United States have risen sharply over the last decade. The frozen asparagus industry has been especially hard hit with import pressures. For example, in 1994 imports of frozen asparagus into the US totaled 1.8 million lbs but by 2002 that figure had jumped to 4.43 million lbs, for an increase of 250%. The latest Food Institute Report, dated February 2, 2004, indicate that the flood of imported asparagus is continuing. For the period of January 1 – December 1, 2002, 4.43 million lbs of frozen and 3.39 million lbs of canned asparagus were imported into this country. In the same period in 2003 frozen imports increased 72% to 7.70 million lbs and imports of canned product increased by 175% to 9.34 million lbs!

During the 2001 production season, an estimated 1500 acres of Michigan asparagus was abandoned due to imports. The asparagus price dropped 33% from 2000 to 2001, resulting in a loss to the industry of nearly \$5.5 million. While growers received an average of 45 cents / lb (2001 & 2002), 53 to 58 cents / lb is needed to cover current production costs.

## **APPROACH TO PROBLEM**

To survive and thrive in a global economy the Michigan asparagus industry must expand its production for the fresh market, identify and develop new asparagus products and reduce costs associated with producing traditional processed products.

Late in the fall of 2002 the Michigan Asparagus Advisory Board (MAAB) challenged the state's asparagus processors to develop concepts for new products or more efficient processing techniques that would have a long-term positive impact on the industry as a whole. Two major ideas surfaced from these contacts. First was the need to develop processing technology, packaging, and then the marketing of whole-spear individually quick frozen (IQF) asparagus. Presently whole-spear asparagus is either canned or "wet-packed" frozen. Most wet-packed frozen asparagus is sold in a 2.5 lb box as a solid "block". Although the technology to freeze individual spears through a nitrogen process is developed, this method is quite costly and thus hinders consumer acceptance. Most Michigan asparagus processors (freezers) own and operate IQF "tunnels" in which they process cut-and tip (a spear of asparagus cut into 1.5 inch sections) asparagus which is frozen in individual pieces. Previous attempts to freeze whole spear asparagus in these tunnels have resulted in an unacceptable amount of damage to the spear. The industry believed that if this equipment could be modified and packaging could be developed to protect the integrity of whole-spear IQF asparagus that a significant market could be developed for this product.

The MAAB and asparagus processors also identified a potential new market for a value added asparagus product, such as a breaded, deep fried, asparagus spear and related products. Currently several vegetables such as cauliflower, okra and mushrooms have developed significant industries in this area. A number of Michigan restaurants offer a batter dipped, deep fried asparagus utilizing fresh product during season. Restaurant owners have indicated that this is a highly successful and profitable item for them and have expressed interest in offering this product on a year-round basis.

New product development, although critically important for competing in today's marketplace, is expensive and carries a good deal of risk. New product development can only be successful with the following three elements: time, resources and a strong commitment to the product. It is the philosophy of the MAAB that this can be best accomplished in private hands and that MAAB's role is one of guidance, encouragement, and providing seed monies if available.

Three Michigan asparagus processors, Coloma Frozen Foods, Inc., Michigan Freeze Pack, and Chase Farms submitted potentially viable new product or processing concepts, agreed to partner with the MAAB, and committed significant resources of their own, to develop these concepts. It was expected that this initiative would provide new opportunities for marketing Michigan asparagus products, create a “home” for asparagus that is being displaced by imports and that existing jobs in the local economy would be retained and possibly expanded.

### **Goal and Objectives**

#### **Goal**

Development of new and value added asparagus products in order to expand the industry and remain competitive in a global marketplace.

#### **Objectives**

1. New value-added asparagus product development allowing consumers to make a healthy and safe meal in a shorter amount of time.
2. New product development for food service market.
3. New value added product prototype manufacturing and evaluation.
4. New manufacturing technology resulting in reduced processing costs thus allowing the industry to re-capture business lost to foreign competitors.
5. Manufacturing of small quantities of new product for trade presentations.
6. Develop strategy for new product launch in the market.

These objectives support the following priorities of FSMIP:

- a. Assessing customer response to new or alternative agricultural products.
- b. Evaluating potential opportunities for U.S. producers and processors in domestic markets.
- c. Evaluating opportunities for processors to respond directly to new or expanding consumer demands for products and value-adding services.
- d. Using technology to develop new processing methods.

## RESULTS

Coloma Frozen Foods, Inc. (CFF) set out to develop a commercially acceptable breaded asparagus product for both the industrial and food service sectors. Previous inquiries indicated market potential. CFF's work was focused in two areas. Market research was undertaken to answer questions regarding shape, size, uniformity, packaging and self-life. Armed with this new information they then began work with a firm that specializes in breaded products to develop a finished project. Coloma Frozen Foods presented MAAB with a complete report of their activities and expenditures. That document is included, as submitted, in this report. See Attachment A.

Chase Farms, Inc. began work on their project in April of 2003. Engineers began laying out a new processing line for the handling and freezing of whole spear asparagus. Ammonia coils were brought into their facility and work began on creating the line. Although much progress was made in 2003 no production was possible during the short (May – June) Michigan asparagus season.

During the winter of 2003 – 2004 a number of contacts were made with potential buyers. Although no product had been produced for sample, the concept of a competitively priced IQF whole spear was presented and favorably received.

Plans were to complete the assembly of the line prior to May 1<sup>st</sup> of 2004 and begin test runs of product and perform line modification as needed during the asparagus harvest season. Due to unforeseen problems in the plant the line never became operational prior to the asparagus season.

Chase Farms, Inc. and MAAB mutually agreed that due to Chase Farms failure to perform as per their agreement that no FSMIP monies would be paid to Chase Farms, Inc.

Chase Farms indicated to MAAB that they still see potential for the product and they plan to continue development of the line at some future time.

Michigan Freeze Pack Company (MFP) began work on engineering and construction of a new processing line for individually quick frozen (IQF) asparagus in the early spring of 2003. The emphasis throughout this phase of the project was to eliminate as many “drop” points as possible in order to minimize damage to the asparagus spear. Excessive damage to the head or tip portion of the spear had foiled previous attempts at using IQF tunnels for processing whole spear asparagus. Two new lines were designed, one to prepare raw asparagus for freezing as an IQF whole spear and the second to sort and package the frozen spear as it exited the freezer. The prep line included a way to place the raw product on the belt that took it to the cutters where it was cut to length. The product was then placed on another belt where it was sorted and transported to the blancher and on to the freezer. Once frozen the final line then resorted the product and several stations were created to pack the product. Two different types of final packing were developed. The first simply placed spears in bulk containers for potential sales to industrial clients or food service customers and in late spring a second packing line was developed that placed portions of asparagus into microwaveable trays for the retail trade.

The new lines proved successful with the finished product of high quality and consistent in taste. Also, spear tip damage was largely eliminated. The problem that remained however was that maximum production obtained was 700 pounds of finished product per hour. Commercial production at this rate of production would not be economically feasible but grant monies allowed continued production until sufficient product was produced for large-scale sampling.

Coincidental to the on going testing and trial production of whole spear IQF asparagus being produced during the spring of 2003 was the development of a patented “microwaveable” tray by SteamWay Corporation of Indiana. Gary Hopkins Sr., president of SteamWay, contacted the Michigan Asparagus Advisory Board to share some results of tests that they had performed on a number of frozen vegetables utilizing their new technology. Sensory testing of frozen asparagus spears in the SteamWay microwaveable tray had yielded very high marks with many describing the product as tasting “farm fresh”.

MAAB shared this information with Michigan processors and two, Honee Bear Canning Co. of Lawton, MI and Michigan Freeze Pack Co. Hart, MI both followed up with inquiries. It was learned that Honee Bear had been in prior contact with Steam Way Corporation and felt that the product had great potential but presently lacked a volume of frozen asparagus product to do large-scale test marketing. Michigan Freeze Pack was very interested in the concept now that they had a potential market for their new product and eventually both companies in conjunction with SteamWay, introduced samples of microwave cooked asparagus to the public with favorable results.

Honee Bear, a company with considerable retail experience, caught the attention of the world’s largest retail outlet and was able to secure a contract for a private label, 12-ounce container of a freezer-to-microwave SteamWay tray of whole spear asparagus. MAAB, at that point, saw an opportunity for a joint venture and scheduled separate meetings with both Honee Bear and Michigan Freeze Pack. Honee Bear then contacted Michigan Freeze Pack and indicated that they would be interested in purchasing a large volume of IQF whole spear asparagus from them if it could be purchased competitively. Michigan Freeze Pack, a company whose strength is as an industrial supplier of frozen fruits and vegetables, was more than happy to let another company do the marketing as that would allow them to focus on their strength, production.

The learning period of spring 2003 left one huge unanswered question: “Could production volumes of IQF whole spear asparagus be greatly increased while maintaining a high quality finished product?” While in 2003 Michigan Freeze Pack was able to produce 30,000 pounds of finished product in the entire season they now would be required to produce that volume in a single day. The volume demanded that MFP immediately begin engineering and design of a larger cutting line and packing line, in addition to upgrading their entire process travel network. Additionally, a much larger staff of production employees would need to be hired to enable processing of asparagus 18 hours a day.

The ability to source fresh asparagus from the western United States in March, allowed MFP to receive spears that already had been trimmed to the required length of 6½ inches (maximum steam tray dimensions). Purchasing loads of pre-trimmed asparagus, as needed (and prior to the Michigan season), allowed MFP staff to concentrate on properly freezing and packing the asparagus all the while making line

modifications to ramp up production volumes. At the same time modifications were being made to the receiving and trimming end of the line in order to handle large volumes of oncoming Michigan Asparagus. As the west coast asparagus season began to dwindle, the Michigan season started in May and proceeded into the third week of June. All effort resulted in a process that averaged more than 2,500 pounds of finished product per hour and a year-end total of 1.9 million pounds delivered into storage.

### **Impact to the Industry and Community**

The impact of the FSMIP grant on the Michigan (and U.S.) asparagus industry was immediate and significant. Through hard work, a cooperative spirit, and a little luck an immediate market was commercially developed for whole spear IQF asparagus. Of the 1.9 million pounds of IQF whole spear asparagus produced in 2004 by Michigan Freeze Pack nearly 1.5 million pounds was delivered by Michigan asparagus growers. It is safe to say that much of this production would have been left in the field if it were not for this new market. Traditionally Michigan canners purchase roughly 65% of the raw asparagus for processing while Michigan freezers purchase 35% (15.4 versus 8.4 million pounds per year, average 2000 – 2003\*). Demand for canned asparagus was down sharply in 2004 with a \*reported 13.2 million pounds purchased from Michigan farmers. 2 of 5 Michigan canners quit receiving weeks prior to the end of the harvest season due to reduced raw product needs. One other canner reduced the number of farms it purchased asparagus from by nearly 2/3rds. A few farms were forced to cease harvesting of asparagus earlier than desired thus leaving as much as 35% of the potential production (and all of their profit) in the field. This negative scenario would have been widespread had it not been for the diversion of 6% of the entire Michigan processing pack to this new IQF whole spear market.

Job creation and retention was an additional bonus. Michigan Freeze Pack employed nearly 100 seasonal workers per day through the 2004 asparagus harvest season as compared to 35 per day in 2003. In addition layoffs and loss of their 25 permanent employees was reduced or eliminated.

Although the immediate impact of the Coloma Frozen Foods project was minor compared to that of MFP the potential for a “brand new” asparagus product is very good. Grant monies allowed them to develop a concept into a viable product and initial interest is encouraging. Marketing of the product continues with the present emphasis on the foodservice trade. One or two upscale national restaurant chains offering this product could instantly create significant demand. Coloma Frozen Foods continues to explore the oven-ready concept aimed at the retail trade. The SteamWay Corporation has just developed a microwaveable tray designed to cook breaded foods to a crisp coating texture. Developed for fish, SteamWay is confident that the tray will work well for breaded asparagus and efforts are underway to bring Coloma Frozen Foods and SteamWay together for product testing and development.

## **Contact Information**

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## **Contractors**

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## Exhibit A

### EXPANDING THE MICHIGAN ASPARAGUS INDUSTRY THROUGH NEW PRODUCT DEVELOPMENT AND ENHANCED PROCESSING TECHNOLOGIES

Coloma Frozen Foods, inc.  
Final Report

To the MICHIGAN ASPARAGUS ADVISORY BOARD

#### BACKGROUND

In order to survive and thrive in a global economy, the Michigan Asparagus industry must identify and develop markets beyond their traditional processed outlet. MAAB and asparagus processors believe that the expansion of the fresh market coupled with the development of value added products and new processing technologies is vital to the future of this important Michigan industry.

**MAAB and asparagus processors have also identified a potential new market for value added asparagus product, such as breaded asparagus, deep fried, asparagus spear and related products. Currently several vegetables such as cauliflower, okra and mushrooms have developed significant industries in this area. A number of Michigan restaurants offer an appetizer dish of deep fried asparagus utilizing fresh product during season. Restaurant owners have indicated that this is a highly successful and profitable item for them and have expressed interest in offering this product on a year-round basis. Work needs to focus on the manufacturing and packaging technologies as well as the marketing of an acceptable, shelf stable, frozen product.**

#### GOAL AND OBJECTIVES

**Goal:** Development of new and value added asparagus products in order to expand the industry and remain competitive in a global marketplace.

**Objectives:**

1. New value added asparagus product development allowing customers to make a healthy and safe meal in a shorter amount of time.
2. New product development for food service market.
3. New value added product prototype manufacturing and evaluation.
4. New manufacturing technology resulting in reduced processing costs thus allowing the industry to re-capture business lost to foreign competitors.

5. Manufacturing of small quantities of new product for trade presentation.
6. Develop strategy for new product launch in the market.

### MARKET TRENDS FOR VEGETABLES

**The health message about fruits and vegetables is the basis for the “5-A-Day” program, which promotes eating at least five servings per day of fruits and vegetables. In the U.S., self-reported intake of vegetables averaged 3 1/3 servings per day during 1994-96. However consumer awareness of the 5-A-day recommendation increased from 8 percent in 1991 to 39 percent in 1997. As Americans become more aware of the health benefits of vegetables, producers and processors will have opportunities to supply these nutritious, colorful foods to informed customers.**

Asparagus is as virtuous a vegetable as, say, broccoli. Low in calories and high in flavor, a serving of four asparagus spears (60 grams) contains 10 calories, 1 gram protein, 2 grams carbohydrates and only traces of fat. It's also rich in vitamin A and riboflavin and a good source of thiamin. Asparagus contains dietary fiber, which has significant role in a human diet.

Michigan ranks third behind California and Washington in the production of asparagus. Michigan is known as a processing state of asparagus. Only a small portion of Michigan's crop is sold fresh. Most restaurants get their fresh asparagus from California during summer, fall and winter, but as the spring continues, their orders will be filled with crops from elsewhere. Asparagus processors offer frozen and canned asparagus spears or cuts and tips. Frozen asparagus can be good substitute for fresh asparagus. Often the flavor and appearance of frozen vegetables will actually be superior to that of fresh vegetables, which begin losing flavor within few days – sometimes even hours – of harvest. Frozen vegetables will offer consistent quality year-round.

Frozen vegetables have several advantages:

- shelf life of up to one year allows frozen vegetables always be in season,
- these products provide labor savings both in food service operations and households,
- every ounce of frozen vegetables is usable,
- consistent piece size and blend ratio,
- convenient storage,
- nutrient loss in frozen product is much lower than in fresh.

So frozen vegetables offer not only consistent quality, but also provide operational advantages over fresh.

**Analyzing the potential market – both food service operation and households we found out that there are two major trends what customers are looking for: consistent high-quality and easy preparation. Higher-income, well-educated individuals are a potential market segment for specialty produce and niche food products. Women still predominately make food purchase and preparation decisions in most households. With increasing number of women employed outside of the home, marketing strategies that address time constraints, convenience,**

**availability, quality, and relative price are important. On the other hand food processors and restaurateurs alike understand that value-added prepared foods can cut costs and almost guarantee quality, even with modestly skilled labor in the kitchen.**

## **NEW ASPARAGUS PRODUCT DEVELOPMENT**

The value-added asparagus project was presented to several buyers in both the industrial and food service sectors. Questions regarding shape, size, uniformity, packaging and shelf life were discussed as well as the ability to sustain the product throughout the year.

A firm that specialized in breaded products, with an innovative R&D department, was procured to determine the applicability of breading or coating Individually Quick Frozen (IQF) pieces of asparagus and to develop several samples of coatings. This company also introduced several questions or defined questions previously raised by the buyers or people on our own team.

2. Is the visual product more attractive using no head material
  - a. Is it practical to sort head and stem material
3. Are spears (rather than cut and tip) more attractive/cost effective
4. Can the product be made “oven ready”
5. Will the product stand re-pack options into private label poly bags

The coating company was successful in maintaining a uniform coating on frozen IQF cuts and tips. There was concern over the appearance of the pieces of head material. Two very different formulations were sent back to us for cuttings. We drew in two different panels of people to test the two samples and judged them on both appearance and taste. The results were tabulated and then discussed with production and marketing.

It was felt at that time that some improvement was needed before the product could be taken to marketing in sample or prototype form. A conference was held with the coating company and they agreed to go back to R&D with our comments and suggestions and to try again.

In the meantime, marketing continues to set up potential avenues of distribution and to pique the interest of potential buyers. Tentative meetings at trade shows are set up or being set up to demonstrate the product in anticipation of an acceptable product.

The coating company recently sent down their latest sample and a cutting is being planned. Visually, the product is exactly what was asked for and we are anticipating that the taste profile will also meet our expectations.

## **RESULTS AND CONCLUSIONS**

Some change in direction occurred as the product was seen and tested. Some of the original questions during development turned out to be negative in response notably, would the product be “oven ready”. The marketing focus turned strictly to food service. Upscale casual restaurants would need to be focused on and it became apparent that a partnership with a company or companies that sold a wide range of products into that venue would need to be sought. To date, there are three companies that are evaluating the product and will make the decision to partner with us or not with this product.

**Further, we found that most coating companies have poly bag capabilities and the product can and should be packed in the end packaging.**

**Head material is not a serious cosmetic or taste issue to most and the difficulty of separating head from good cut pieces is still a problem. End cuts were suggested and rejected because of the excess of fiber. Uniformity in diameter is an issue both from appearance and the variability in cook times. Sized product should be used.**

**In conclusion the first part of the project is completed and the product appears to be very marketable. Initial presentations have been positive but it will take another one to two years to present the product, perhaps refine it, to find if it will be accepted into the mainstream marketplace. We also are not satisfied with the “non-oven ready” status and will pursue a product that is “user friendly” for the retail trade.**

## **CONTACT FOR FURTHER INFORMATION**

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